

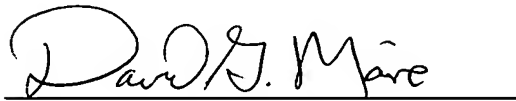
In the 12/16/2004 Response under 37 CFR 1.111, the applicant reserved the right to provide additional evidence that the extra components of the Worrell composition would materially change the characteristics of the applicant's claimed composition. Such evidence is attached hereto in the form of Fig. 6521 on page 191 of "Phase Diagrams for Ceramists Volume VI" which shows that the melting temperature of  $\text{ZrO}_2$  is about  $2,700^\circ\text{C}$  while the melting temperature of  $\text{TiO}_2$  is only about  $1,850^\circ\text{C}$ . Thus, the addition of the third oxide of titanium dioxide that is taught by Worrell would significantly lower the melting temperature of the applicant's claimed composition, thereby materially changing its characteristics as a thermal barrier coating material.

The applicant also provides Fig. 375 on page 144 of "Phase Diagrams for Ceramists Volume I" which shows that the melting temperature of  $\text{NbO}_{2.5}$  is  $1,491^\circ\text{C}$  and the melting temperature of  $\text{TaO}_{2.5}$  is  $1,872^\circ\text{C}$ . These melting temperatures are significantly lower than the melting temperature of  $\text{ZrO}_2$ , thus the addition of these compounds as taught by Maze would significantly lower the melting temperature of the applicant's claimed composition, thereby materially changing its characteristics as a thermal barrier coating material.

With regard to the Kondo reference, it is noted that the presently claimed compositions are cubic matrix structures, whereas Kondo specifically drives his composition to include the monoclinic phase in order to improve its utility as an ingot material. Although Kondo allows for as much as 40 wt% stabilizer, such high stabilizer materials do not include yttria stabilized zirconia. The attached Fig. 5251 on page 141 of "Phase Diagrams for Ceramists Volume IV" shows that the monoclinic phase of a zirconia-yttria system can exist only below about 10 wt% yttria. This is consistent with all of the specific examples described by Kondo, which all contain significantly less than the presently claimed 30 wt% stabilizer. Thus, the general statement in Kondo regarding possible high levels of stabilizer does not support the rejection of the present claims, and in fact Kondo actually teaches away from the YSZ materials of the present claims because Kondo requires high monoclinic phase content.

Should the Examiner have any question about the materials provided herein or the Response Under 37 CFR 1.111 that was submitted concurrently with the Request for Continued Examination on 12/16/2004, he should feel free to contact either the undersigned attorney or attorney John Musone who signed the 12/16/2004 paper.

Respectfully submitted,

A handwritten signature in cursive script, reading "David G. Maire", is written over a horizontal line.

David G. Maire (Reg. No. 34,865)

Beusse Brownlee Wolter Mora & Maire, P.A.  
390 North Orange Ave., Suite 2500  
Orlando, FL 32801  
Telephone: 407-926-7704